

# Megapixel Mercury Cadmium Telluride Focal Plane Arrays for Infrared Imaging out to 12 Microns, Phase I

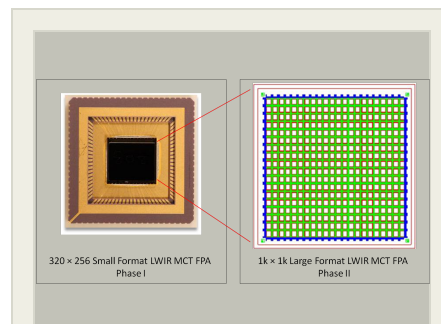
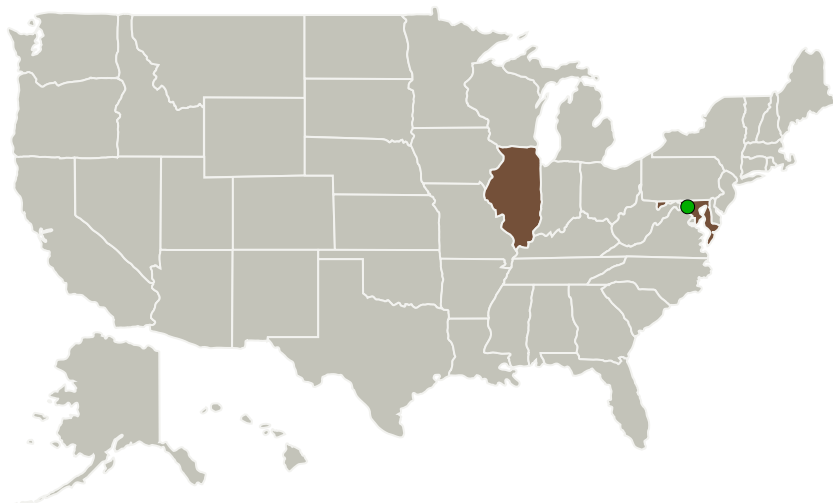
Completed Technology Project (2014 - 2014)



## Project Introduction

We propose the fabrication of large format, long wave infrared (LWIR) mercury cadmium telluride (HgCdTe or MCT) detector arrays where the cutoff wavelength is extended to 12 micron at cryogenic temperatures for use in missions to near earth objects, comets, and the outer planets. The MCT detector arrays will be a high performance improvement to meet the detector needs for future NASA missions. The MCT material for these detector arrays will be grown by molecular beam epitaxy on cadmium zinc telluride (CdZnTe or CZT) substrates to produce high quality semiconductor material with low defect densities. In this Phase I proposed effort EPIR, Inc. (EPIR) will fabricate a prototype focal plane array (FPA) where a 12 micron cutoff LWIR MCT detector array on a CZT substrate will be hybridized to a small format readout integrated circuit (ROIC) for capability demonstration purposes. EPIR will deliver this prototype FPA to the government for further evaluation. Should this effort progress to Phase II, then LWIR MCT detector arrays will be fabricated for hybridization to large format 1k x 1k ROICs for implementation into future planetary science space missions.

## Primary U.S. Work Locations and Key Partners



Megapixel mercury cadmium telluride focal plane arrays for infrared imaging out to 12 microns Project Image

## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

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Organizations Performing Work	Role	Type	Location
EPIR Technologies, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	Bolingbrook, Illinois
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

## Primary U.S. Work Locations

Illinois	Maryland
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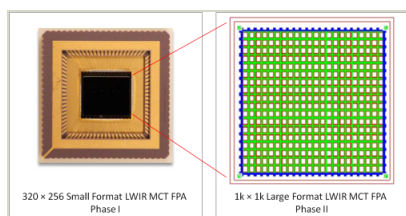
## Project Transitions

**June 2014:** Project Start**December 2014:** Closed out

### Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137554>)

## Images



### Project Image

Megapixel mercury cadmium telluride focal plane arrays for infrared imaging out to 12 microns

Project Image  
(<https://techport.nasa.gov/image/128906>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

EPIR Technologies, Inc.

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

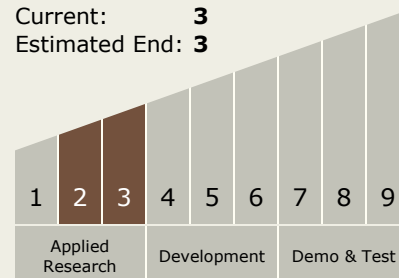
Carlos Torrez

### Principal Investigator:

Jeremy Bergeson

## Technology Maturity (TRL)

Start: 2  
Current: 3  
Estimated End: 3



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## Technology Areas

### Primary:

- TX08 Sensors and Instruments
  - └ TX08.1 Remote Sensing Instruments/Sensors
    - └ TX08.1.1 Detectors and Focal Planes

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System